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भारतीय मानक

बढ़ई का गुनिया — विशिष्ट

( पहला पुनरीक्षण )

*Indian Standard*

**CARPENTER'S SQUARES — SPECIFICATION**

*( First Revision )*

UDC 674'1'051 : 531'747

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**BUREAU OF INDIAN STANDARDS**  
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**FOREWORD**

This Indian Standard ( First Revision ) was adopted by the Bureau of Indian Standards, after the draft finalized by the Woodworking Hand Tools Sectional Committee had been approved by the Production Engineering Division Council.

This standard was first issued in 1967. Carpenter's squares are primarily used for testing and checking trueness of an angle or flatness or/and squares and observing if light shows between the work-piece and the square.

While revising this standard, assistance has been taken from BS 3322 : 1980 'Carpenter's square and bevels' issued by British Standards Institution ( BSI ).

# Indian Standard

## CARPENTER'S SQUARES — SPECIFICATION

### ( First Revision )

**1 SCOPE**

**1.1** This standard covers the requirements of carpenter's square.

**2 REFERENCES**

**2.1** The following Indian Standards are necessary adjuncts to this standard:

IS No.	Title
280 : 1978	Mild steel wire for general engineering purposes ( <i>third revision</i> )
319 : 1974	Free-cutting brass bars, rods and sections ( <i>third revision</i> )
1570 ( Part 2 ) : 1979	Schedules for wrought steels: Part 2 Carbon steels ( unalloyed steels ) ( <i>first revision</i> )

IS No.

Title

2103 : 1980	Engineer's squares ( <i>second revision</i> )
3179 : 1976	Feeler gauges ( 0.03 to 1 mm ) ( <i>first revision</i> )
3510 : 1966	Toolmakers' flats and high precision surface plates

**3 NOMENCLATURE**

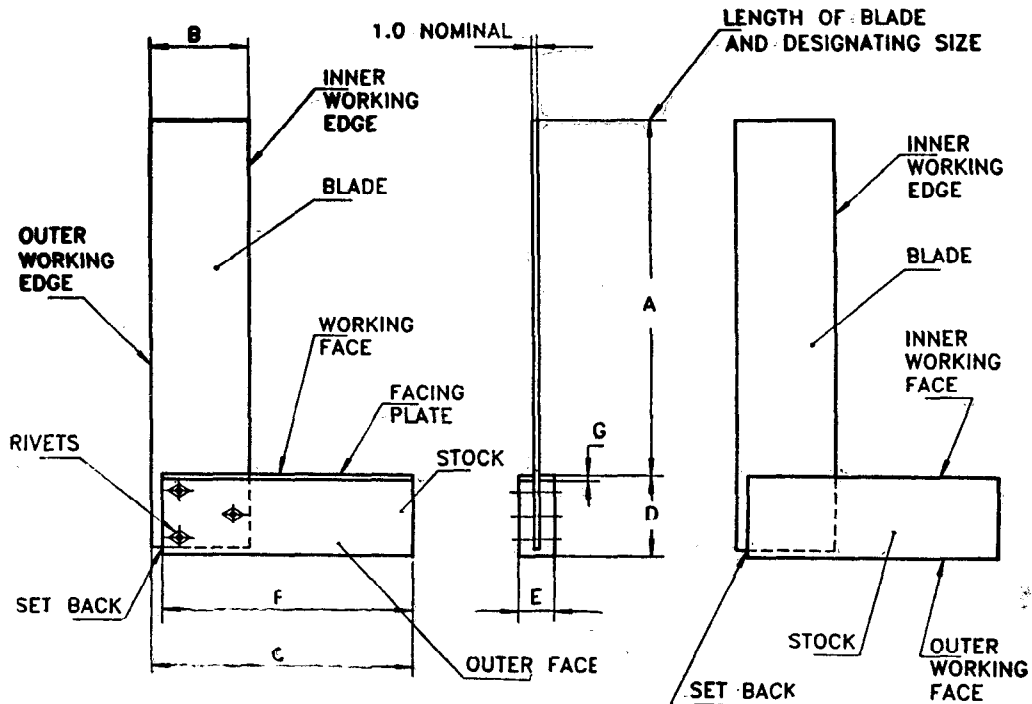
**3.1** For the purpose of this standard, the nomenclature as given in Table 1 shall apply.

**4 DIMENSIONS**

**4.1** The dimensions of carpenter's square shall be as given in Table 1.

**Table 1 Dimensions for Carpenter's Squares**  
( Clauses 3.1 and 4.1 )

All dimensions in millimetres.



Nominal Size	A	B	C	D	E	F	G
100	100	50	110	40	15	100	3
150	150	50	135	40	20	130	3
200	200	55	145	45	20	140	3
250	250	55	170	45	20	160	3
300	300	65	215	50	20	205	3

## 5 HARDNESS

5.1 The blade of the carpenter's square shall be hardened and tempered to achieve hardness in the range of 418 HV to 460 HV.

## 6 MATERIAL

6.1 The blades shall be manufactured from suitable steels meeting the requirements given in 5 and 8.

*Suitable Examples* : Steel designation 50C4 or 55C8 of IS 1570 (Part 2) : 1979.

6.2 The rivets shall be manufactured from mild steel wire conforming to IS 280 : 1978 or brass conforming to IS 319 : 1974.

6.3 The face plate shall be made from brass conforming to IS 319 : 1974. The stock shall be manufactured from any good quality seasoned wood, such as ebony (*Diospyros sp.*) or rosewood (*Delbergia latifolia* Roxb.) and shall be free from deleterious defects and shall be straight grained. The timber shall be free from sapwood, decay (rot), insect holes, knots, checks, splits, warp, waness and other defects.

6.3.1 Alternatively the stock may be made from malleable cast iron or suitable plastics.

## 7 MANUFACTURE, WORKMANSHIP AND FINISH

### 7.1 Manufacture and Workmanship

7.1.1 All working faces and edges of the squares together with components shall be smoothly finished. When plates, tips and spacers are used they shall be smoothly finished and flush with adjacent surfaces.

7.1.2 Facing plates on wooden stocks shall be positively secured to the stock.

7.1.3 Tips and the spacers on the stock for the squares shall be positively secured to the stock.

### 7.2 Finish

#### 7.2.1 Blades

The blades shall be smoothly finished and shall be chemically blued or blackened or suitably protected.

#### 7.2.2 Stocks

The stocks shall be smoothly finished and if made of wood shall be varnished/polished.

#### 7.2.3 Other Metal Parts

Other metal parts shall be given a suitable anti-corrosion treatment.

## 8 ACCURACY

### 8.1 Straightness of Working Faces ( Inner and Outer ) and Working Edges

The difference between the highest and lowest points of the working face shall not exceed an amount equal to 0.01 mm per 10 mm of the stock length. The difference between the highest and lowest points of the blade working edge shall not exceed 0.05 mm. A typical method of test is given in Annex A.

### 8.2 Parallelism of Working Faces and Working Edges

The maximum error in parallelism between the working and outer face shall not exceed 0.38 mm and between working edges shall not exceed 0.1 mm. When the blade is graduated the tolerance on the nominal length shall be  $\pm 1$  mm at a temperature of 27°C. The positional error of the whole scale relative to the selected face shall be  $\pm 1$  mm at a temperature of 27°C. A typical method of test is given in Annex A.

### 8.3 Squareness

8.3.1 The inner working edge of the blade of each square shall be square to the working face of the stock, subject to a maximum tolerance equal to the 0.01 mm per 10 mm of the blade length when measured at the tip of the blade. ( see Fig. 1 ). A typical method of test, is given in Annex A.

8.3.2 The maximum departure from lateral squareness ( see Fig. 1 below ) of the blade of each square with reference to the working face of the stock shall not exceed an amount equal to 0.05 mm per 10 mm of the blade length when measured at the tip of the blade.

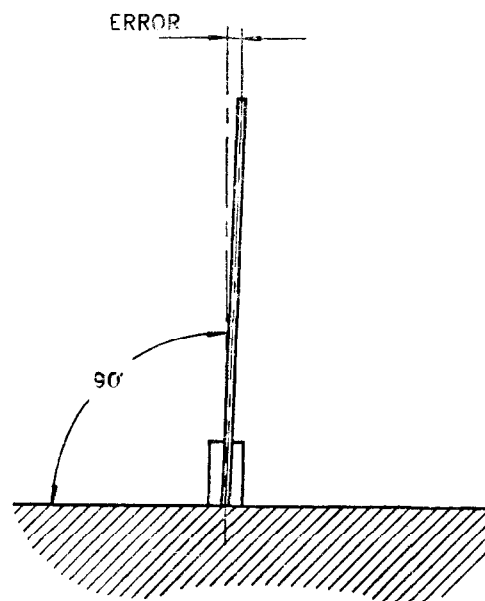


FIG. 1 ERROR IN LATERAL SQUARENESS

## 9 PERFORMANCE TEST

### 9.1 Permanent Set

Secure the stock firmly and flex the tip of the blade through an angle of  $15^\circ$  in either lateral direction for all other sizes of bevels. The blade of each bevel shall be fully extended and in line with the stock when conducting this test. No permanent set shall result on bevel blade.

### 9.2 Blade Security

Apply a load of 4 kg on the edge of the blade at a distance of X ( 100 mm from the stock for squares of 100 mm blade length and 150 mm from the stock for all other sizes ). The load shall fall freely on to the edge of the blade from a height of 100 mm as shown in Fig. 2. The blade and stock shall remain positively and permanently fixed after the test.

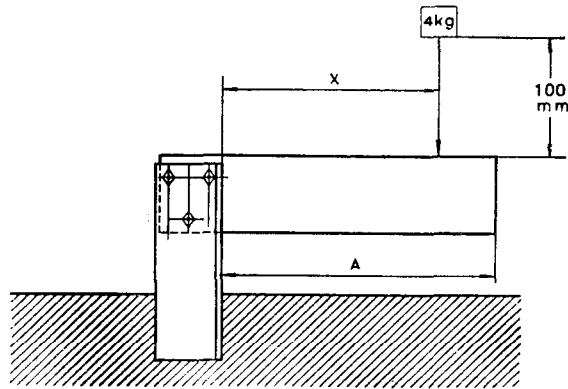


FIG. 2 TEST FOR BLADE SECURITY OF CARPENTER'S SQUARE

*Example:* A Carpenter's square of nominal size 100 mm shall be designated as:

Carpenter's Square IS 4017 — 100.

## 10 DESIGNATION

**10.1** The Carpenter's square shall be designated by the commonly used name, nominal size and number of this Indian Standard.

## 11 MARKING

**11.1** The carpenter's square shall be legibly marked with the manufacturer's name or trade-mark and the nominal size.

## ANNEX A

( Clauses 8.1, 8.2 and 8.3.1 )

### METHOD OF TESTING ACCURACY

#### A-1 CHECKING THE STRAIGHTNESS OF WORKING FACES AND WORKING EDGES

The working faces and working edges of the squares can be tested for accuracy by bedding them evenly on the working surface of a grade B surface plate, conforming to IS 3510 : 1966 and ensuring that a feeler gauge conforming to IS 3179 : 1976 and with a thickness of the maximum tolerance as specified in 8.1. shall not pass between them and the surface plate.

#### A-2 CHECKING THE PARALLELISM OF FACES AND OF WORKING EDGES

The parallelism of the working and outer face of a square specified in 8.2. can be checked by direct measurement.

#### A-3 CHECKING SQUARENESS

The squareness of the inner working edge of the blade of a square to its working face as specified in 8.3.1 may be checked by comparing it to a grade A engineers square conforming to IS 2103 : 1980.



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